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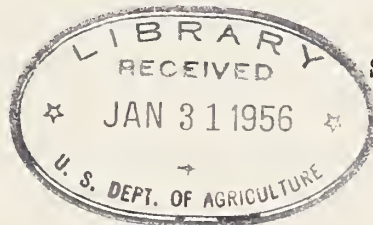
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A STUDY OF THE EFFECT OF NEW TIMES OF SERVICE UPON MILK CONSUMPTION  
IN 70 SELECTED SCHOOLS PARTICIPATING IN THE SPECIAL SCHOOL MILK  
PROGRAM IN KENTUCKY

This report summarizes the findings and conclusions of one in a series of studies of the Special School Milk Program undertaken by State educational agencies in cooperation with the United States Department of Agriculture, Agricultural Marketing Service. Funds to conduct these studies were made available by the Commodity Credit Corporation to permit the appraisal and development of new and more effective methods of increasing the availability and consumption of milk in schools.

This study was undertaken by the Kentucky Department of Education in the fiscal year 1955. The study was conducted by Cephas Bevins, Supervisor, Special School Milk Program, under the direction of Kearney Campbell, Director, Division of School Lunch, State Department of Education. John B. Roberts, of the Division of Marketing, Agricultural Experiment Station, University of Kentucky, served as Consultant on the project.

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Purpose of Study

To determine the effect of one or more than one new times of milk service (exclusive of lunch hour service) on milk consumption in schools. Also included in the study is an analysis of delivery and in-school milk handling problems encountered in the establishment of new times of service and methods used by schools in solving these problems.

Procedure for Conduct of Study

Seventy schools were selected for study. The average daily attendance for the month of March (the month under review) in these schools was over 32,000 students. Schools were selected from elementary, secondary and combination levels representing small, medium, and large schools located in rural and urban areas. Although the numerical size of the sample is small, the number of schools in the sample represents about 10 percent of the total number of Kentucky schools participating in the Special School Milk Program during the 1954-55 school year. Some of the pre-requisites for selection of sample schools were:

1. The school had served milk at noon prior to the operation of the Special School Milk Program.
2. New times of service were those established under the Special School Milk Program between the beginning of that program in Kentucky schools in November 1954 and March 1, 1955. Each school had complete freedom in determining the milk serving practices employed.
3. Each school agreed to have the entire program remain constant as to times of service, price, etc., during March 1955.

The principal tool for an analysis in this report is comparison of March consumption with consumption during the previous October and during the "base" period -- an average of consumption in December 1953 and January 1954.

### Conclusions

1. Problems can be expected when new times of milk service are added to the school's daily program of activities. They may include:

- a. Setting up and operating a schedule for obtaining milk in the proper amounts at the proper time;
- b. Providing a time and place for serving milk under supervision;
- c. Obtaining adequate refrigeration for the increased milk supply which accompanies participation in the Special School Milk Program.

2. Solutions to these problems, for the most part, depend upon an understanding of the situation by the school administrators and the development of a spirit of cooperation between the school and the supplying dairies. Solutions to milk handling and delivery problems are reached primarily at the local level.

3. The greatest potential for achieving increased consumption lies both in expanding the number of participating schools and in extending participation among pupils within the schools already serving milk. The rate of milk consumption per pupil in Kentucky schools is fairly high and greater effort should be exerted toward broadening participation.

4. Participation in secondary schools is considerably lower than participation in the elementary schools. This offers an opportunity for increasing total consumption.



5. The per pupil rate was greater for secondary school pupils than for elementary pupils. This might be expected when size of children in the two categories is compared.

6. Daily per pupil rates of consumption were greater for the smaller schools than for the larger schools.

7. The price factor appears to have varying degrees of importance as far as consumption is concerned. For the State sample of 70 schools, greater increases are associated with lower prices paid per half pint by the child. On the other hand, it is apparent that other forces exert an influence upon consumption. This is revealed in a case study which showed only minor increases when milk was served free of charge, and very little change in consumption when the price was raised from 0 cents to 3 cents per half pint. It was felt that new times of service and a positive attitude on the part of school administrators are essential to the successful operation of the Special School Milk Program.

8. The Special School Milk Program can increase milk consumption, as evidenced by the 51 percent gain for the State sample.

9. New times of serving milk during the school day result in increased consumption.

10. The number of new times of service affects consumption. It appears that schools with only one new time of service achieve a greater gain in milk consumption than those schools with no new times of service or with more than one new service. This seems to be due to the planning and emphasis which accompany the one new time of service. The availability of more than one new time of service tends to be a permissive program, lacking emphasis and planning.

## Analysis of Data

### Part I. Effect of Introducing New Times of Service

New times of milk service were introduced in 62 of the 70 schools surveyed in this study. For comparative purposes, eight schools without new times of service were also studied. Table I indicates that morning and afternoon milk service were about equally popular in the schools. Milk service in the sample schools varied from before classes began to the period between dismissal and bus departure. Each school developed a service program best adapted to its own needs.

This section of the summary deals with effects of new times of service upon milk consumption by the school children in several typical situations, size of school, location of school and type of school.

Table I. Number of schools initiating new times of service at various times.

<u>New Time of Service</u>	<u>Number of Schools</u>
No Additional Times of Service	8
Before Noon	
Before Classes Begin	16
Mid-morning Recess	26
Mid-morning Other	36
Afternoon	
Before Classes Begin	4
Mid-afternoon Recess	29
Mid-afternoon Other	33
Just Before Dismissal	5
Between Dismissal and Bus Departure	5

Tables II and III indicate that the smaller the school, the smaller was the total percentage gain over base consumption, but these schools had the greater per pupil rate of consumption both before and after the

Special School Milk Program was in operation. It is obviously easier for the schools with a lower consumption rate in October to increase their consumption than for those schools with a high initial rate.

Table II sets forth consumption data for the month of March 1955, with respect to the experimental schools.

Table II. Comparison of participation and per pupil consumption rates in Kentucky schools by size, location and type of school.

Classification:	Average Daily Attendance	Estimated No. Children Drinking Milk	Estimated Percent Participation	Consumption Rate Based Upon Enrollment <sup>a/</sup>
<u>SIZE</u>				
249 or less	2,348	1,803	77	1.16
250 - 599	16,758	10,890	65	.83
600 or more	13,577	8,784	65	.72
<u>LOCATION</u>				
Rural	18,039	12,406	69	.85
Urban	12,406	9,071	62	.88
<u>TYPE</u>				
Elementary	6,380	4,608	72	.98
Secondary	1,930	954	49	.77
Combination	24,373	15,915	65	.66
<u>SAMPLE TOTAL</u>	32,683	21,477	66	.81

<sup>a/</sup> Indicates many children received more than one half pint of milk per day.



Table III. Percentage gain over base and per pupil consumption rates as affected by the number of new times daily milk was made available to children during March 1955 and size, location and type of school. a/

Item	Percentage Increase				Daily Rate Per Capita-1/2 Pt.	
	:	:	More	Sample	October	March
	:None:	One:	than One:	Total	1954	1955
<u>Size of School</u>						
249 or less	24	57	38	41	.94	1.16
250 - 599	26	81	44	54	.59	.84
600 or more	23	73	53	51	.53	.72
<u>Location</u>						
Rural	16	72	48	51	.63	.85
Urban	30	81	48	50	.55	.77
<u>Type</u>						
Elementary	35	56	52	49	.72	.98
Secondary	--	46	16	36	.67	.77
Grades 1-12	13	90	48	52	.55	.66
Sample Total	24	74	48	51	.59	.81

a/ Base is the average daily consumption of half pints of milk consumed by children in the school during December 1953 and January 1954.

Milk consumption in rural schools exceeded urban school consumption before the program. Percentage increases under the program were 51 and 50, respectively, during the program. This resulted in maintenance of about the same ratio of differential as occurred before the program.

Milk consumption per child was greatest in the elementary schools, next highest in secondary and lowest in combined schools, grades 1-12. After the program was inaugurated, consumption increases were larger for elementary and combined schools. As a result, milk consumption differentials between secondary and combined have narrowed.

Table IV analyzes the total milk consumption in the selected schools and compares it with consumption during the base period. The increase in milk consumption over the noon hour level is attributed to the additional times milk is served during the day.

Table IV. Consumption Analysis - March 1955

New Times Each:	Number :	a/ :	Total :	Noon :	Increase :
Day Milk Is :	of :	"Base" :	Consumption :	Consumption :	Due To :
Made Available:	Schools :	Consumption :	and Percent :	and Percent :	New Times :
to Children :	Reporting:	(Half Pints) :	of Base :	of Base :	of Service :
None	8	52,240	64,713 (124%)	64,713 (124%)	None
One	20	90,958	158,710 (175%)	104,302 (115%)	54,408 (60%)
More than One	42	284,850	421,112 (148%)	295,572 (104%)	125,540 (44%)
Total	70	428,048	644,535 (151%)	464,587 (109%)	179,948 (42%)

a/ "Base" is the average daily consumption of half pints of milk consumed by children in school during December 1953 and January 1954. "Normal Base" consumption and Actual (total) consumption were compared for October 1954. The comparison showed an 11 percent gain of Actual over Normal which was approximately the same as the increase in enrollment.

Within the 70 sample schools an increase of 51 percent in the total milk consumption level over base was attained during the month of March 1955. The table indicates that 9 percent of the increase occurred at noon and a net gain of 42 percent appears due to consumption at new times of service.

In schools which added no new times of service an increase of 24 percent was noted at the noontime service. With additional times of service total consumption increased significantly but consumption increases at noon were somewhat less. For one new time of service the increase was 75 percent of which 15 percent occurred at noon and 60 percent at the new time of service. For schools with more than one new time of service, the figures were 48 percent, 4 percent, and 44 percent, respectively.

The study apparently indicates that schools with one new time of service achieved greater increase in consumption than schools with more than one new time or with no new times of serving milk. Various interpretations and explanations for this may be given.

1. In cases where only one new time of service was initiated, the one new time of service may have received more emphasis than in other schools where their efforts were spread over more than one new time of service.

2. Incidental and sporadic periods of milk availability are not well enough organized and supervised to achieve large gains.

3. Wishful thinking in regard to new times of service resulted in distorted classifications for reporting purposes. For example, one school reported making milk available at 14 periods other than lunch time, yet achieved a gain of only 5 percent over base.



Table V. The relation existing between new times of service and the price charged to the pupil for milk -- consumption analysis by price and new times of service, March 1955.

Price Paid by :		Number of New Times of Service							
Child Per Half:		None		One		More than One		Total	
Pint of Milk		No.Schools:	% Gain:	No.Schools:	% Gain:	No.Schools:	% Gain:	No.Schools:	% Gain
0¢	--	--	--	2	205	1	619	3	288
1-2¢	4	25	13	49	15	56	32	49	
2-1/2-3¢	2	10	5	69	16	45	23	45	
Over 3¢	2	37	--	--	10	18	12	21	
Total	8	24	20	74	42	48	70	51	

For the sample schools studied, as shown in Table V, it appears that the greatest gains in milk consumption over base are achieved in those schools with the lowest price per unit of milk. Eliminating the factor of price from this tabulation, the greatest average percentage increase in milk consumption is achieved under the category of one new time of service. Schools with more than one new time of service attained greater gains than those schools with no new times of milk service. The inference is made that if the schools with more than one new time of service were to stress those periods as do the schools with only one new time, the consumption results might favor more than one new time of service.

The following summarized case studies of schools point up the effect of additional times of service on milk consumption.

In School A, a combined 12-grade rural school, with an enrollment of 600 or more students, there was an average monthly milk consumption of 9,822 half pint units of milk during the period December 1954 through May 1955. (Table VI) No new times of milk service were instituted at this school. In March the price of milk was reduced from 5 cents to 3 cents per unit.

Table VI. Price and consumption data for School A.

Month	: Cost to : Child Per : Half Pint	: Total : Consumption : Half Pints	: Percent : Increase : Over Base	: : Percent : Participation	: Rate Per : Pupil Based : on ADA
1954					
December	5¢	6,702	8	80	.78
1955					
January	5¢	11,177	11	79	.80
February	5¢	10,433	9	81	.82
March	3¢	12,196	11	81	.82
April	3¢	10,621	17	83	.84
May	3¢	7,801	17	81	.82

In this school, little change can be noted in the percentage gain even though the price was reduced by 2 cents per unit of milk. Percent participation and consumption rate per pupil show little variation from month to month. It would seem that a greater gain should have been obtained as the result of lowering the price, but the failure to obtain a substantial gain in this school is attributed to the fact that milk consumption was already high and that no new times of milk service were made available.

School B, a combined 12-grade rural school, with an enrollment of 600 or more students, served milk at mid-morning and mid-afternoon periods of the school day, in addition to that served at lunchtime. The price per unit of milk was reduced on March 1, 1955, from 2 cents to 0 cents per unit. (Table VII) The following table shows the effect on the total and per pupil milk consumption level.

Table VII. Price and consumption data for School B.

Month	: Cost to : Child Per : Half Pint	: Total : Consumption : Half Pints	: Percent : Increase : Over Base	: : Percent : Participation	: Rate Per : Pupil Based : on ADA
February (20 days)	2¢	10,962	294	57	0.73
March (21 days)	0¢	20,990	619	82	1.33
April (19 days)	0¢	15,616	491	82	1.09

The immediate effect of reducing the price from 2¢ to 0¢ on March 1, resulted in a marked increase in consumption, 619 percent over base for the month. Stating the magnitude of the increase in another way, March consumption increased 91 percent over the February consumption level which was already fairly high.

In this school, it is shown that a price reduction caused a rise in the percent of students participating in the program. The author pointed out that the administration of this school believed in and enjoyed the benefits of the Special School Milk Program as evidenced by the level of milk consumption attained at the school before the price reduction took place.



## Part II. In-School Milk Handling Problems

Most problems encountered in the sample schools involved obtaining proper milk deliveries and handling the milk in the schools.

1. Milk delivery problems were encountered by 13 percent of the sample and basically involved getting an adequate supply of milk on time. Solutions were of a local nature, with each school working out the problem to its best advantage. The following are examples of some problems encountered and the solutions worked out between the milk dealer and the school administrators.

<u>Problem</u>	<u>Solution</u>
Milk not always delivered on time.	Bought milk from two companies, one delivering early and the other later in the day.
One dairy could not furnish enough milk.	Bought milk from two dairies.
Milk delivered too early, inadequate refrigeration at school during warm weather.	Requested dairy to deliver milk just prior to milk service or provide a cooler.
Dairy delivered milk twice a day.	Milk company supplied cooler free of charge, cutting out one delivery.
School was paying 5-1/2 cents per half pint of milk.	Changed dairies and now pays 5 cents per unit.
Ran short of milk.	Added to milk order. Consumption leveled off after first week.

Milk handling problems were reported by 19 percent of the sample. These problems included lack of refrigeration, inadequate sanitation, unfavorable delivery schedule, supervision of children while drinking milk and milk carton disposal. Nine of the schools had refrigeration

problems which were solved by the installation of milk coolers, refrigerators, or a change in the milk delivery schedule so that it would be closer to the time of milk service.

One school faced the problem of the time wasted when large groups wanted milk at the same time. This was solved by setting up several shorter periods for smaller groups of students to get milk. In another school where difficulty was encountered in disposing of the milk cartons, the solution was a switch to glass bottles. (Health regulations may require rinsing of bottles before returning them to the dairy. Glass bottles require cases in which they can be stored, creating a potential problem of empty bottles and cases until picked up by dairy. The solution in this instance appears to be the possible exchange of one problem for several others. However, it appeared to solve this school's problem.)







